

What is Claimed is:

1. A drum type washing machine comprising:

a tub of plastic having a wall for holding washing water therein and mounting a driving part thereon;

a drum rotatably arranged inside of the tub;

a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;

at least one bearing for supporting the shaft;

a bearing housing having a sleeve form of bearing supporting part, and a stator fastening part extended in a radial direction from the bearing supporting part, wherein both of the bearing supporting part and the stator fastening part are inserted in a tub rear wall, while stator fastening holes in the stator fastening part are exposed;

a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and

the stator mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor,

wherein the stator includes;

an annular helical type core having multiple layers formed by winding a steel plate having tooth portions and a base part in a helix starting from a bottom layer to a top layer,

an insulator having the helical type core encapsulated therein,

a coil wound on the tooth portions, and

fastening parts formed as a unit with the insulator, having fastening holes projected toward an inside of the helical type core for fastening the stator to the bearing housing.

2. The drum type washing machine as claimed in claim 1, wherein the fastening part has a height greater than 20% of a total stack height of the helical type core.

3. The drum type washing machine as claimed in claim 1, wherein the fastening hole in the fastening part has a spring pin.

4. A drum type washing machine comprising:

- a tub of plastic having a wall for holding washing water therein and mounting a driving part thereon;
- a drum rotatably arranged inside of the tub;
- a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;
- at least one bearing for supporting the shaft;
- a bearing housing having a sleeve form of bearing supporting part, and a stator fastening part extended in a radial direction from the bearing supporting part, wherein both of the bearing supporting part and the stator fastening part are inserted in a tub rear wall, while stator fastening holes in the stator fastening part are exposed;
- a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and
- the stator mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor,
- wherein the stator includes;
- an annular helical type core having multiple layers formed by winding a steel plate having tooth portions and a base part in a helix starting from a bottom layer to a top layer,

an insulator having the helical type core encapsulated therein,
a coil wound on the tooth portions, and

fastening parts formed as a unit with the insulator, having three or more than three fastening holes projected toward an inside of the helical type core for fastening the stator to the bearing housing.

5. The drum type washing machine as claimed in claim 4, wherein the fastening part has a height greater than 20% of a total stack height of the helical type core.

6. The drum type washing machine as claimed in claim 4, wherein the fastening hole in the fastening part has a spring pin.

7. A drum type washing machine comprising:

a tub of a plastic having a wall for holding washing water therein and mounting a driving part thereon;

a drum rotatably arranged inside of the tub;

a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;

at least one bearing for supporting the shaft;

a bearing housing having a sleeve form of bearing supporting part inserted in the tub rear wall, and a stator fastening part formed as a unit with the bearing supporting part extended from the bearing supporting part exposed to an outside of the tub, with stator fastening holes formed in an exposed part of the stator fastening part;

a rotor engaged to a rear end part of the shaft to form the motor together with the

stator; and

the stator mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor,

wherein the stator includes;

an annular helical type core having multiple layers formed by winding a steel plate having tooth portions and a base part in a helix starting from a bottom layer to a top layer,

an insulator having the helical type core encapsulated therein,

a coil wound on the tooth portions, and

fastening parts formed as a unit with the insulator, having fastening holes projected toward an inside of the helical type core for fastening the stator to the bearing housing.

8. The drum type washing machine as claimed in claim 7, wherein the fastening part has a height greater than 20% of a total stack height of the helical type core.

9. The drum type washing machine as claimed in claim 7, wherein the fastening hole in the fastening part has a spring pin.

10. The drum type washing machine as claimed in claim 7, wherein the fastening hole in the fastening part has a metal tube press fit therein.

11. A drum type washing machine comprising:

a tub of a plastic having a wall for holding washing water therein and mounting a driving part thereon;

a drum rotatably arranged inside of the tub;

a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;

at least one bearing for supporting the shaft;

a bearing housing having a sleeve form of bearing supporting part inserted in the tub rear wall, and a stator fastening part formed as a unit with the bearing supporting part extended in a radial direction from the bearing supporting part exposed to an outside of the tub, with stator fastening holes formed in an exposed part of the stator fastening part;

a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and

the stator mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor,

wherein the stator includes;

an annular helical type core having multiple layers formed by winding a steel plate having tooth portions and a base part in a helix starting from a bottom layer to a top layer,

an insulator having the helical type core encapsulated therein,

a coil wound on the tooth portions, and

fastening parts formed as a unit with the insulator, having three or more than three fastening holes projected toward an inside of the helical type core for fastening the stator to the bearing housing.

12. The drum type washing machine as claimed in claim 11, wherein the fastening part has a height greater than 20% of a total stack height of the helical type core.

13. The drum type washing machine as claimed in claim 11, wherein the fastening

hole in the fastening part has a spring pin.

14. The drum type washing machine as claimed in claim 11, wherein the fastening hole in the fastening part has a metal tube press fit therein.

15. A drum type washing machine comprising:

a tub of plastic having a wall for holding washing water therein and mounting a driving part thereon;

a drum rotatably arranged inside of the tub;

a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;

at least one bearing for supporting the shaft;

a bearing housing having a sleeve form of bearing supporting part, and a stator fastening part extended in a radial direction from the bearing supporting part, wherein both of the bearing supporting part and the stator fastening part are inserted in a tub rear wall, while stator fastening holes in the stator fastening part are exposed;

a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and

the stator mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor.

16. The drum type washing machine as claimed in claim 15, wherein the stator includes;

a core,

an insulator having the core encapsulated therein,
a coil wound on tooth portions, and
fastening parts formed as a unit with the insulator, having fastening holes projected toward an inside of the core for fastening the stator to the bearing housing.

17. The drum type washing machine as claimed in claim 15, wherein the stator includes;

a core having a helical wound stack,
an insulator of an insulating material having the core encapsulated therein,
a coil wound on tooth portions of the helical core; and
three or more than three fastening parts formed as a unit with the insulator, projected toward an inside of the core.

18. The drum type washing machine as claimed in claim 15, wherein the stator fastening part of the bearing housing includes an extension in an outward radial direction from the cylindrical bearing supporting part, having steps along the radial direction at preset intervals.

19. The drum type washing machine as claimed in claim 15, wherein the stator fastening part includes alternate outward radial direction extensions from front part, and rear part of the cylindrical bearing supporting part in a circumferential direction connected at edges of the extensions substantially perpendicular to the extensions.

20. The drum type washing machine as claimed in claim 15, wherein the stator

fastening part includes alternate outward radial direction extensions from front part, and rear part of the cylindrical bearing supporting part in a circumferential direction connected at edges of the extensions substantially perpendicular to the extensions, the extension having steps at preset intervals along the radial direction.

21. The drum type washing machine as claimed in claim 15, further comprising a positioning hole adjacent to the stator fastening hole in the stator fastening part in correspondence to the positioning pin on the stator.

22. The drum type washing machine as claimed in claim 15, wherein the tub rear wall includes bosses at parts of the tub rear wall opposite to the stator fastening holes for preventing the stator fastening part from coming into direct contact with the stator, thereby preventing the insulator of the stator from being broken due to a fastening force applied thereto in mounting the stator.

23. The drum type washing machine as claimed in claim 15, wherein the stator fastening part includes a rib formed thereon for increasing a bonding force with a plastic in the injection molding of the tub.

24. The drum type washing machine as claimed in claim 23, wherein the rib is formed along a circumferential direction.

25. The drum type washing machine as claimed in claim 23, wherein the rib has fastening bosses each with the stator fastening hole formed therein.

26. The drum type washing machine as claimed in claim 15, wherein the stator fastening part includes a plurality of radial direction outward extensions from the cylindrical bearing supporting part separated at regular intervals in a circumferential direction to form a plurality of separated radial segments.

27. A drum type washing machine comprising:

- a tub of plastic having a wall for holding washing water therein and mounting a driving part thereon;
- a drum rotatably arranged inside of the tub;
- a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;
- at least one bearing for supporting the shaft;
- a bearing housing having a sleeve form of bearing supporting part inserted in the tub rear wall, and a stator fastening part formed as a unit with the bearing supporting part extended in a radial direction from the bearing supporting part exposed to an outside of the tub, with stator fastening holes formed in an exposed part;
- a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and
- the stator with a weight heavier than 1.5kg mounted on the stator fastening part of the bearing housing with fastening members on an inner side of the rotor to form the motor together with the rotor.

28. The drum type washing machine as claimed in claim 27, wherein the stator

fastening part includes a plurality of radial direction outward extensions from the cylindrical bearing supporting part separated at regular intervals in a circumferential direction to form a plurality of separated radial segments.

29. The drum type washing machine as claimed in claim 21, further comprising a positioning hole adjacent to the stator fastening hole in the stator fastening part in correspondence to the positioning pin on the stator.

30. The drum type washing machine as claimed in claim 27, wherein the stator fastening part includes a rib formed thereon for increasing a bonding force with a plastic in the injection molding of the tub.

31. The drum type washing machine as claimed in claim 30, wherein the rib includes fastening bosses each having the stator fastening hole formed therein.

32. The drum type washing machine as claimed in claim 27, wherein the stator includes;

a core,

an insulator having the core encapsulated therein,

a coil wound on tooth portions, and

fastening parts formed as a unit with the insulator, having fastening holes projected toward an inside of the core for fastening the stator to the bearing housing.

33. The drum type washing machine as claimed in claim 27, wherein the stator

includes;

- a core having a helical wound stack,
- an insulator of an insulating material having the core encapsulated therein,
- a coil wound on tooth portions of the helical core, and
- three or more than three fastening parts formed as a unit with the insulator, projected toward an inside of the core.

34. The drum type washing machine as claimed in claim 33, wherein the helical type core includes;

- multiple layers formed by winding in a helix starting from a bottom layer to a top layer,
- tooth portions projected outwardly in a radial direction from a base part, and
- recesses in the base part for reducing stress in the winding of the helical type core.

35. The drum type washing machine as claimed in claim 34, wherein the helical type core includes;

- rivets passed through through holes in the base part for fastening the layers, respectively.

36. The drum type washing machine as claimed in claim 33, wherein the helical type core includes;

- welded parts of the layer with the base part at the bottom layer and the top layer where the winding starts and ends respectively.

37. The drum type washing machine as claimed in claim 34, wherein the recess is rectangular, or trapezoidal.

38. A drum type washing machine comprising:

a tub having a wall for holding washing water therein and mounting a driving part thereon, and a sleeve form of bearing supporting part for supporting bearings, in which both the tub and the bearing supporting part are formed as one unit;

a drum rotatably arranged inside of the tub;

a shaft passed through the tub and connected to the drum for transmission of a driving power from a motor to the drum;

at least one bearing inside of the bearing supporting part for supporting the shaft;

a rotor engaged to a rear end part of the shaft to form the motor together with the stator; and

the stator mounted on the tub on an inner side of the rotor and an outer side of the bearing supporting part with fastening members,

wherein the stator includes;

an annular helical type core having multiple layers formed by winding a steel plate having tooth portions and base part in a helix starting from a bottom layer to a top layer,

an insulator having the helical type core encapsulated therein,

a coil wound on the tooth portions, and

fastening parts formed as a unit with the insulator, having fastening holes projected toward an inside of the helical type core for fastening the stator to the bearing housing.

39. The drum type washing machine as claimed in claim 38, wherein the tub includes

a metal tub supporting plate built-in an outer region of the bearing supporting part formed as a separate piece from the bearing supporting part.

40. The drum type washing machine as claimed in claim 39, wherein the tub is injection molded in a state the tub supporting plate is buried in the tub.